GUEST LECTURE REPORT

DATE: 27th December 2018
EVENT:
TIME: 2.00 PM
VENUE: Seminar Hall, KITS Guntur
ORGANIZED BY: SPACE, E.C.E Dept.
FACULTY INCHARGE: Mr. K.Murali Krishna

EVENT DESCRIPTION:

The ECE association "SPACE" conducted a Guest lecture on **"ELECTRO MAGNETIC FIELD AND TRANSMISSION LINES"** by **Dr.Y.V.Narayana,** Principal,Tirumala Engineering College, Narsaraopet on 27th December 2018 from 2.00PM to 3.40 PM. This guest lecture was conducted to boost the student's knowledge towards electromagnetic.


SESSION ACTIVITIES:

The Department of E.C.E has made proper arrangements for transportation for the guest to the campus. As per the given instructions by the **Dr. Siva Ganga Prasad, HOD ECE dept**., the faculty in made proper arrangements for this event. The program started with opening remarks of HOD. Later principal sir introduced the speaker to the students. Exactly at 2.30PM the guest lecture was started.

In this lecture he covered the following topics

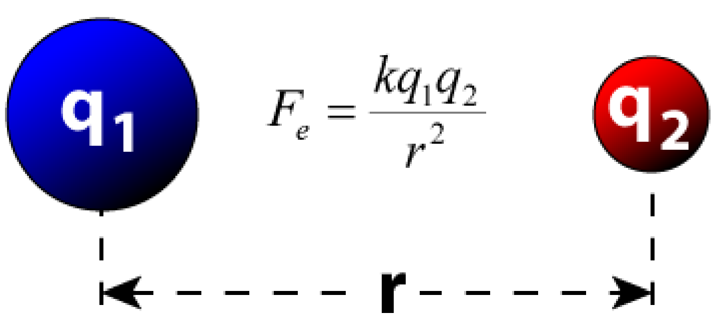
- Fradays law
- Columbs law
- Gauss law
- Maxewells equations
- Biot-savarts law
- Amperes law

Fradays law

Faraday's laws of electrolysis relate the amount of liberated mass at an electrode to the quantity of electricity passing through the electrode. Faraday's first law states that the amount of current passed through an electrode is directly proportional to the amount of material liberated from it. Faraday's second law of electromagnetic induction states that the magnitude of induced emf is equal to the rate of change of flux linkages with the coil.

Coulomb's Law

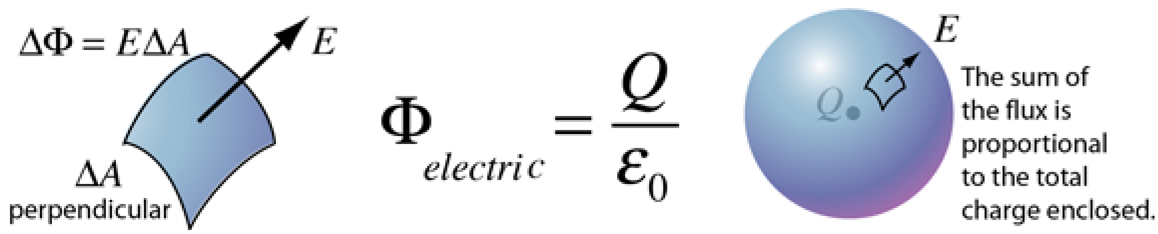
Coulomb's Law gives an idea about the force between two point charges. By the word point charge, we mean that in physics, the size of linear charged bodies is very small as against the distance between them. Therefore, we consider them as point charges as it becomes easy for us to calculate the force of attraction/ repulsion between them.



Charles-Augustin de Coulomb**,** a French physicist in 1784, measured the force between two point charges and he came up with the theory that the force is inversely proportional to the square of the distance between the charges. He also found that this force is directly proportional to the product of charges (magnitudes only).

Gauss's Law

The total of the electric flux out of a closed surface is equal to the charge enclosed divided by the permittivity.



The electric flux through an area is defined as the electric field multiplied by the area of the surface projected in a plane perpendicular to the field. Gauss's Law is a general law applying to any closed surface. It is an important tool since it permits the assessment of the amount of enclosed charge by mapping the field on a surface outside the charge distribution. For geometries of sufficient symmetry, it simplifies the calculation of the electric field.

Another way of visualizing this is to consider a probe of area A which can measure the electric field perpendicular to that area. If it picks any closed surface and steps over that surface, measuring the perpendicular field times its area, it will obtain a measure of the net electric charge within the surface, no matter how that internal charge is configured.

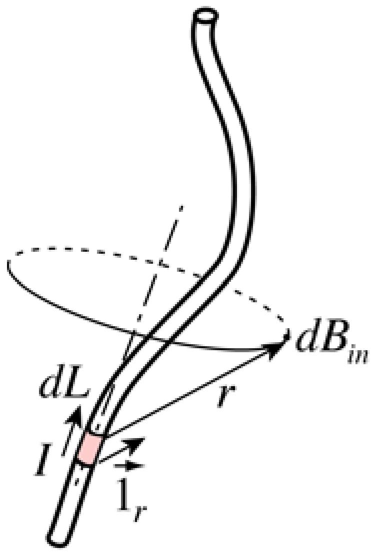
Maxwell's Equation

1. $\nabla \cdot \mathbf{D} = \rho_V$
2. $\nabla \cdot \mathbf{B} = 0$
3. $\nabla \times \mathbf{E} = -\frac{\partial \mathbf{B}}{\partial t}$
4. $\nabla \times \mathbf{H} = \frac{\partial \mathbf{D}}{\partial t} + \mathbf{J}$

Maxwell's Equations are laws - just like the law of gravity. These equations are rules the universe uses to govern the behavior of electric and magnetic fields. A flow of electric current will produce a magnetic field. If the current flow varies with time (as in any wave or periodic signal), the magnetic field will also give rise to an electric field. Maxwell's Equations shows that separated charge (positive and negative) gives rise to an electric field - and if this is varying in time as well will give rise to a propagating el ectric field, further giving rise to a propgating magnetic field.

Biot-Savart Law

The Biot-Savart Law relates magnetic fields to the currents which are their sources. In a similar manner, Coulomb's law relates electric fields to the point charges which are their sources. Finding the magnetic field resulting from a current distribution involves the vector product, and is inherently a calculus problem when the distance from the current to the field point is continuously changing.



Magnetic field of a current element

$$d\vec{B} = \frac{\mu_0 I d\vec{L} \times \vec{1}_r}{4\pi r^2}$$

where

$d\vec{L}$ = infinitesmal length of conductor carrying electric current I

$\vec{1}_r$ = unit vector to specify the direction of the the vector distance r from the current to the field point.

See the magnetic field sketched for the straight wire to see the geometry of the magnetic field of a current.

The speaker shared his knowledge with the students. All II year students actively participated in the guest lecture. In the valedictory function, he was honored by the Principal sir with a Shalv and Memento. Finally the session ended with NATIONAL ANTHEM